

ABSTRACT OF THE DISCLOSURE

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3 The invention provides a method and system for adaptive point to multi-
4 point wireless communication. The method and system integrate adaptive and dynamic
5 responsiveness for communication parameters related to multiple characteristics of wire-
6 less communication links, both for a single sender and a single receiver, and for sets of
7 multiple senders and multiple receivers. Moreover, the method and system are self-
8 optimizing in the sense that they are adaptively and dynamically responsive to results of
9 attempts to optimize parameters related to multiple characteristics of wireless communi-
10 cation links. Multiple characteristics of wireless communication links are optimized si-
11 multaneously, in that the optimal set of values for a plurality of N characteristics, rather
12 than N individual optimal values for each characteristic, is adaptively and dynamically
13 selected. A wireless PHY layer and a wireless MAC layer collectively include a set of
14 communication parameters, each of which is adaptively modified by a BSC for commu-
15 nication with a plurality of CPE. The BSC adjusts communication with each CPE indi-
16 vidually and adaptively in response to changes in communication characteristics, includ-
17 ing both changes in communication characteristics between the BSC and each selected
18 CPE, and changes in communication characteristics induced by concurrent communica-
19 tion between the BSC and multiple CPE. Particular communication characteristics
20 adapted for can include physical characteristics, transport characteristics, and application
21 characteristics. A wireless transport layer includes adaptive and dynamic characteristics
22 responsive to communication characteristics between the BSC and each selected CPE,

1 and between the BSC and multiple CPE. These communication characteristics are re-
2 sponsive to each individual communication link so as to optimize communication band-
3 width between the BSC and each selected CPE. These include (a) BSC control of a
4 TDMA protocol, preferably TDD; (b) BSC control of frequency reuse for CPE, and (c)
5 BSC control of spatial separation of LOS, OLOS, or NLOS communication paths with
6 CPE; each responsive to measured BER and requested communication bandwidth de-
7 mand. The BSC provides point-to-point and point-to-multipoint wireless communication
8 services using parameters continuously adaptive to current conditions, each individual-
9 ized to one or more selected CPE. The wireless transport layer includes burst mode mes-
10 sages from the BSC downstream to individual CPE, and similarly includes burst mode
11 messages from individual CPE upstream to the BSC. This allows the BSC and each indi-
12 vidual CPE to communicate so as to optimize throughput in a communication direction
13 (downstream or upstream) for each communication link between the BSC and an individ-
14 ual CPE.